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ABSTRACT

This module, one of 25 on vocational education training for careers in environmental health occupations, contains self-instructional materials on collecting industrial health information. Following guidelines for students and instructors and an introduction that explains what the student will learn are three lessons: (1) collecting and organizing pre-survey information about workflow and workers through use of a facility floor plan and by developing job aids; (2) collecting information about what biological, chemical, and physical agents are used, and where and how they are stored to prevent accidents; and (3) collecting information about the practices workers follow to prevent accidental exposure to toxic and/or hazardous materials. Each lesson contains objectives, recommended methods and locations for practice, performance criteria, equipment and supplies to perform a task, detailed step-by-step instructions for learning a task, and performance exercises. Performance tests cover the subject matter of each lesson. (CT)

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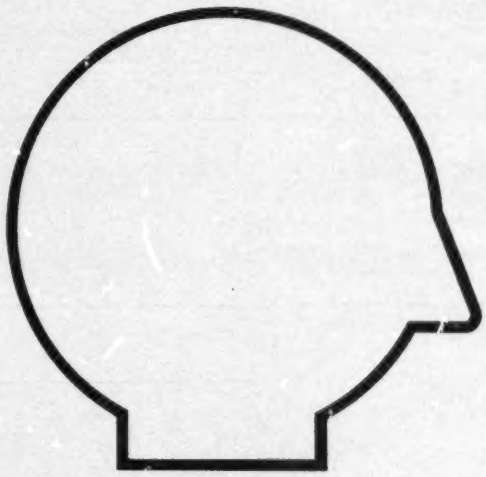

Collecting Industrial Health Information

Module 5

U S DEPARTMENT OF HEALTH
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CE 027 487

FOREWORD

The Curriculum and Instruction Branch of the Office of Vocational and Adult Education, U.S. Department of Education, identified a need to improve the training opportunities for vocational education students interested in pursuing careers in environmental health. To fulfill that need, Consumer Dynamics, Inc., a Rockville, Maryland, based company, was awarded the contract to develop performance-oriented, competency-based modules in the environmental health sciences.

COLLECTING INDUSTRIAL HEALTH INFORMATION is one of the modules in the series, "Vocational Education Training in Environmental Health Sciences." The module content is based on selected texts and other materials in the environmental health field. The module is intended to supplement existing course materials.

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USING THESE SELF-INSTRUCTION MATERIALS

This self-instruction learning package or module is designed to allow both students and instructors flexibility of use. Although primarily intended for use in existing training programs, the module can be used by anyone interested in learning new skills or perking up old ones. Therefore, two sets of guidelines are presented--one set addressed to students and the other set addressed to instructors. First, find out how you, the student, should use the materials in this book.

GUIDELINES FOR STUDENTS

Take the Performance Test as a pretest.

When you pick up this book and work through it, your goal will not be a letter grade or a high score on an exam. Instead, you will work to develop skills that you can measure. Before you start work on this module, you should have taken at least three semesters of a 2-year program in environmental health or industrial hygiene, and be able to explain how the agent-host-environment concept applies to the study of industrial hygiene. Also, this module assumes that you are not training for a position as a safety/health inspector with any government agency, but that you will be applying skills developed through study of this module in assisting an industrial hygienist or other safety and health professional to collect information as part of a preliminary survey. You will be qualified through training offered in this module to make basic observations that do not require extensive training in the recognition, evaluation, or control of potentially hazardous exposures to substances used in the workplace. To find out if you need the training presented in this module, first read through the section called PERFORMANCE TEST. If you think you can do all or most of the items in this test, notify your instructor, who will observe your performance as you take the test.

Work on parts you need to practice.

If you do everything well, according to the criteria in the Performance Test guidelines, you will not need to spend time working on this module. If after taking the Performance Test you discover there are parts of the module you need to practice, follow the key to each item in FOR FURTHER STUDY.

USING THESE SELF-INSTRUCTION MATERIALS

Work straight through each lesson in the order presented.

Should you decide to completely work through this module, begin with the INTRODUCTION and go straight through each of the three lessons. The lesson begins with the OBJECTIVE of the training. Follow the instruction for each part in the order presented. Practice each step in a lesson until you can do it according to the criteria stated for the step. At the end of a lesson, do the EXERCISES. When there are audiovisuals listed at the end of a lesson, ask your instructor for help in obtaining them.

Take the Performance Test as a pretest.

Finally, after you have mastered all of the exercises in each lesson, ask your instructor to watch you do each item in the Performance Test. The items in the Performance Test are intended for use as a posttest to evaluate the quality of your performance. Turn now to the Performance Test.

GUIDELINES FOR INSTRUCTORS

Approach

The approach of these materials is to provide the student with the opportunity to learn skills for collecting selected types of industrial healt information through the preparation and use of job aids.

General Instructions

Read through each lesson to determine what support the student will need to complete the activities described in the steps and exercises. For example, in Lesson One, learning activities require the student to develop job aids using actual facility floor plans. Ideally, these activities should be conducted on site in an industrial facility. Therefore, it will be necessary for you to arrange with the manager of a facility to make such a visit. Alternatively, the activities could be performed in your institution's industrial shops. In any case, training should be conducted under real conditions as much as possible for the full effect of training to be gained.

Make available any audiovisuals or reading materials you think would enhance or complement the training opportunity in this module. Use the

items in the Performance Test as the basis for gauging minimum satisfactory performance in fulfilling the objectives.

Specific Instructions

For use in Lesson One Exercises, obtain copies of an industrial facility floor plan corresponding to the facility you plan to have the students visit.

BACKGROUND

When the safety and health professional first enters a workplace, his or her objective is to look for potential causes of health risks to workers. There are several categories of environmental factors and stresses that affect health:

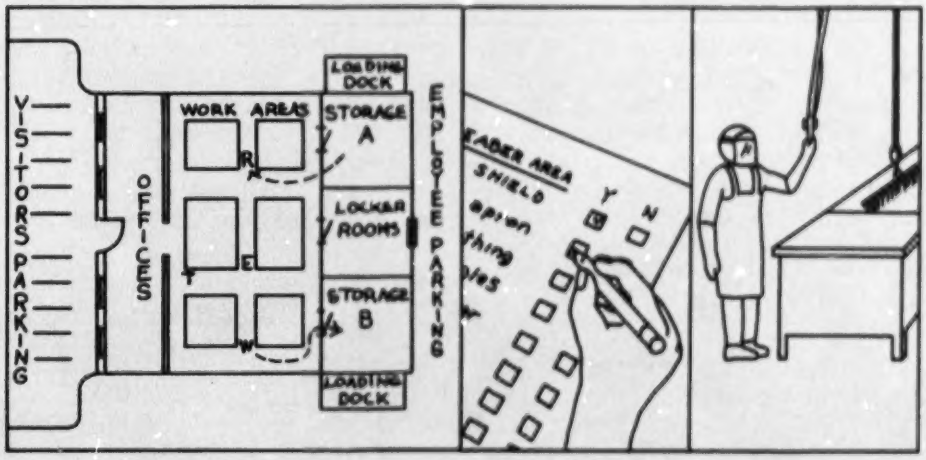
- o biological--insects, fungi, molds, yeasts, bacteria, and viruses;
- o chemical--liquids, dusts, fumes, mists, vapors, or gases;
- o ergonomic--body positions when work is performed, monotony, boredom, worry, and fatique; and,
- o physical--noise, vibration, thermal and pressure extremes, and radiation--by products of a process or operation.

The way these stresses are first identified is through mere observation and use of the basic senses. Through training and experience the safety and health professional has learned to recognize situations and conditions that may create an unhealthful working environment. These observations form the basis for further study and evaluation of actual exposures to harmful biological, chemical, ergonomic, and physical stresses.

In order to determine what further studies need to be performed to evaluate exposure hazards, additional information must be gathered about what materials are used in the manufacturing or processing operations, and how exposures to biological, chemical, and physical agents are controlled and prevented. Some of this information can be collected by someone who has much less training than the industrial hygienist. This person who can accompany the industrial hygienist should be able to collect basic information about the materials used in the workplace, and make simple observations about the wearing of personal protective equipment and hygiene practices workers follow in the workplace.

WHAT YOU WILL LEARN

When you finish working through the steps and exercises in this module, you will be able to collect preliminary survey information that will add to that which the safety and health professional will obtain during a walk-through survey to characterize safety and health risks to each worker in an industrial facility.



You will learn these skills in three lessons:

- o Lesson One

  You will be able to collect and organize presurvey information about workflow and workers through use of a facility floor plan and by developing job aids.

- o Lesson Two

  You will be able to collect information about what biological, chemical, and physical agents are used, and where and how they are stored to prevent them from becoming hazards.

- o Lesson Three

  You will be able to collect information about the practices workers follow to prevent accidental exposures to toxic or otherwise hazardous materials.

LESSON ONE

OBJECTIVE

You will be able to collect and organize presurvey information about workflow and workers through use of a facility floor plan and by developing job aids.

WHERE AND HOW TO PRACTICE

To practice the steps and do two of the exercises in this lesson, you will need to visit an industrial shop at your institution or at a small nearby industrial processing or manufacturing facility. In either case, your instructor will need to schedule your visit. Before going on that visit, read through the steps and exercises in this lesson. You must understand what type of information you are seeking before going on the site visit. If you have any difficulty with any part of the lesson, ask your instructor for help.

HOW WELL YOU MUST DO

You must be able to label a copy of the facility floor plan with symbols and routing marks that can be verified by your instructor or online supervisor from the area you are describing on the plan. You must be able to develop job aids that will enable you to collect the information you are seeking without referring to any other sources of information, including this module. You must be able to collect 90 percent of the information required in each of the steps and exercises in order to fulfill the objective of this lesson.

THINGS YOU NEED

You will need the following equipment and supplies:

- a spiral-bound notebook
- several sharp pencils
- an eraser
- a 12-inch ruler
- felt-tip pens, four or five colors, with fine points.

Instructions: Now turn to the next page and begin work on Lesson One, "Getting There--Steps."

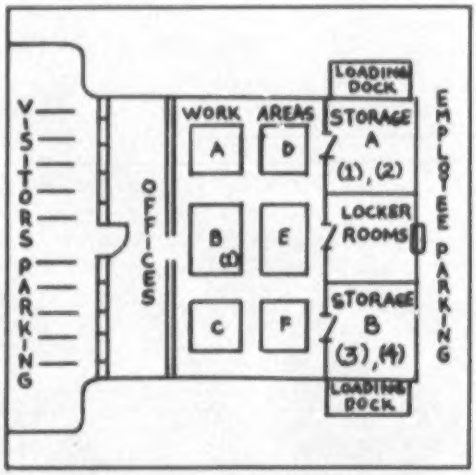
GETTING THERE--STEPS

STEP 1

Before entering any work or storage areas in the facility you are visiting, obtain a copy of the floor plan from the facilities engineer or plant manager. In the company's administrative offices, sit down with one of these individuals or the shop steward or foreman. You will be able to organize several groups of information by using the facility floor plan. First, identify the following storage and work areas for:

- materials that are consumed in the operation process (1)
- materials used in cleaning and lubricating equipment (2)
- materials requiring special handling, such as biohazards, radiologicals, and carcinogens (3)
- toxic or hazardous wastes, including contaminated clothing or equipment (4).

KEY POINT 1



Use the facility floor plan to identify storage and work areas.

STEP 2

Using the colors indicated below, mark the direction and flow of work on the floor plan:

BLUE

- locations at which raw or intermediate materials are removed from shipping containers and transferred to processing equipment (R)

GREEN

- locations where partially and fully processed products are transferred to other plant processing equipment or to containers for processing elsewhere (T)

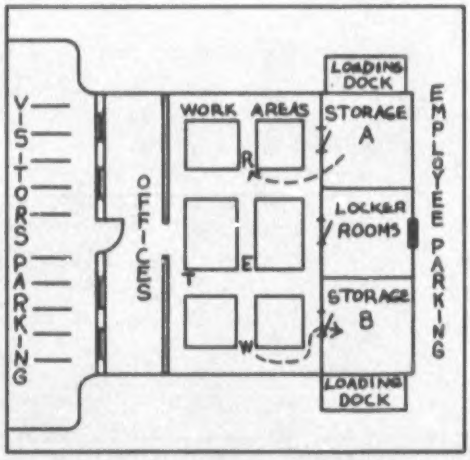
RED

- locations where the person in Step 1 working with you believes workers may be at the greatest risk of being exposed to or coming in contact with hazardous agents (E)

YELLOW

- locations where toxic wastes are removed and packaged for disposal (W).

KEY POINT 2



Mark the direction and flow of work on the floor plan.

STEP 3

From the production superintendent, the chief process engineer, plant chemist, or online supervisor, obtain a copy of the latest inventory listing of biological, chemical, and physical agents used in each work area. Ask to have those agents included that are used in an entire processing cycle, including production of the product and operation, maintenance, and repair of equipment in each area. If possible, organize the inventory according to the flow of work. Obtain any Material Safety Data Sheets that the company may have developed. If you are unable to obtain the inventory, you will need to develop one for each area as outlined in Lesson Two.

KEY POINT 3

STORAGE AREA A

Biologicals	Chemicals	Physical Agents
.....	.....	.....
.....	.....	.....
.....	.....	.....

WORK AREA A

Biologicals	Chemicals	Physical Agents
.....	.....	.....
.....	.....	.....
.....	.....	.....

Obtain a list of all biological, chemical, and physical agents used in each work area.

STEP 4

Using the floor plan as an organizing tool, obtain the following as you trace workflow through each work area from the beginning of the process to the end:

- o the number of male and female employees working in each work area
- o the availability of medical records, and injury/illness statistics of these workers
- o job/position descriptions (PD's) for each category of worker in each area
- o a list of personal protective equipment (PPE) each worker is required to wear or use
- o what training in the use of personal protective equipment each worker should receive and has received.

Develop a chart for each area similar to that shown in Key Point 4.

KEY POINT 4

Work Area: _____

Worker Category: _____

Workers: M _____ F _____

Records: n/T*

PD's: n/T

PPE: (1) (list equipment)

Training: n/T

Starting with the first point in the workflow, develop charts of information as shown.

*Number of workers (n) for which information is available out of the total (T) number of workers.

STEP 5

Check the list of personal protective equipment you will need to enter each storage or work area. Before leaving the administrative offices, make sure you have obtained such equipment and that you put it on* before entering each storage or work area. Among the equipment you may need are:

- o hard hat
- o ear plugs and/or ear muffs
- o safety goggles
- o respirator (type depends on environment to be entered)
- o protective clothing
- o gloves, acid/oil resistant or disposable
- o safety shoes, steel tipped and/or with antistatic soles.

KEY POINT 5

Be sure to put on the appropriate equipment required for entering each storage or work area.

*If you do not already know how to fit test and wear a respirator, you should learn this before going to the industrial facility. It is assumed, however, in this module that you know how to wear PPE after a minimum of three semesters in an industrial hygiene/environmental health program.

EXERCISES

Instruction 1: Work through this exercise using a facility plan supplied to you by your instructor, and the lesson steps. Use a separate sheet of paper to develop a job aid for each step. The following are "Helpful Hints" for doing each step:

STEP 1 — Identify each of the types of storage areas on the floor plan. Labels have already been written on the floor plan you will find at the end of this lesson. The plans you may be given at the facility you visit could already have such labels printed on them. If not, select one or two words that describe the areas, including 'Consumed Materials,' 'Maintenance Materials,' and 'Toxic Wastes.'

STEP 2 — Mark the direction of workflow on the floor plan. Devise a key or legend, such as 'R' for removing materials from shipping containers, 'T' for transferring them between work areas, 'E' for highest probability of exposure, and 'W' for wastes that are removed from each of the work areas. Use different colored felt-tip pens for each 'R', 'T', 'E', and 'W', to indicate how the materials are moved or where each R-T-E-W occurs.

STEP 3 — The following guides are provided to help you classify the biological, chemical, and physical agents in the process inventory given to you at the plant:

Biologicals--materials that are made from plants, animals, or combinations of these, and that commonly include microscopic forms such as viruses, bacteria, protein, enzymes, and the like.

Chemicals--raw, intermediate (partially processed), or finished materials used in reactions to produce substances in different forms or chemical composition and chemical compounds used for cleaning and maintaining equipment. Substances that fall in the chemical category include reagents, solvents, synthetic resins, cleaning compounds, and cutting oils.

Physical Agents--refers primarily to radiological materials used in the process, not produced by the process.

The inventory of these agents will probably not be broken down by category of agent or by area in which they are used. Therefore, for each work area, list the agents by category. Until you see an actual facility floor plan or inventory, you will not be able to practice making the job aids described in Step 3.

STEP 4

Obtain information about the workers. Prepare a job aid similar to the one shown in Key Point 4. Indicate how many workers there are, and how many records and job position descriptions (PD's) are available out of the total number.

Try to obtain copies of the job PD's; since you will not have access to the medical information, the safety and health professional you are with will request these if necessary.

List the personal protective equipment (PPE) each category of workers must wear. For example, a plating operator may require an air-purifying respirator with a fullface mask and canister; elbow-length oil-, grease-, and acid-resistant gloves; and a rubberized apron in addition to the usual work clothing that the worker wears. Also indicate the number of plating operators there are in any one workshift. Indicate how many of the plating operators have received training in the use of the respirator and other pieces of PPE. The job aid you develop for collecting worker information might look like the one at the top of the following page.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Work Area: Plating

Worker Category: Plating Operator

Workers: M 3 F 0

(1) Records: 3/3

(2) PD's: 1/3

PPE: (1) air-purifying respirator with full-face mask and canister
Training: 2/3

(2) elbow-length gloves (oil-, grease-, and acid-resistant)
Training: 3/3

(3) rubberized apron
Training: 3/3

STEP 5 Make a list of the personal protective equipment you will need to wear to enter each area. Make a list similar to that found in Step 5 of the lesson.

Instruction 2: Visit a manufacturing facility or industrial shop at the institution you are attending. Obtain a facility floor plan and prepare job aids, following the information provided in the lesson steps and in Instruction 1 of this exercise.

Instruction 3: Compare the job aids you prepared with those other students have prepared on the same facility. Account for whatever differences may be among them.

LESSON TWO

OBJECTIVE

You will be able to collect information about what biological, chemical, and physical agents are used, and where and how they are stored to prevent them from becoming hazards.

WHERE AND HOW TO PRACTICE

The location and conditions for practicing the steps and exercises are the same as those described for Lesson One.

HOW WELL YOU MUST DO

You must be able to develop job aids that will enable you to collect the information you are seeking without referring to any other sources of information, including this module. You must be able to collect 90 percent of the information required in each of the steps and exercises in order to fulfill the objective of this lesson.

THINGS YOU NEED

You will not need any additional equipment or supplies.

Instructions: Now turn to the next page and begin work on Lesson Two, "Getting There--Steps."

GETTING THERE--STEPS

STEP 1

Enter storage and work areas accompanied by one of the individuals listed in Step 3, Lesson One. Remember to put on appropriate personal protective equipment. Heed all warning signs such as those shown in Key Point 1. Write in your notebook where these symbols are displayed as you enter each area.

KEY POINT 1

Look for the warning signs on entering a storage or work area.

STEP 2

Often the degree of hazard is associated with the symbols in Step 1. When you see "DANGER," the potential for being exposed to the hazard is greatest. As a general rule, stay away from parts of work areas where high hazards are present; the safety and health professional in charge of the survey is the only member of your inspection team that should collect detailed data from such an area. Enter an area designated by "WARNING" only when information you are seeking cannot be obtained any other way, and only when accompanied by plant personnel knowledgeable about the nature and extent of the hazard. Work carefully in an area designated "CAUTION."

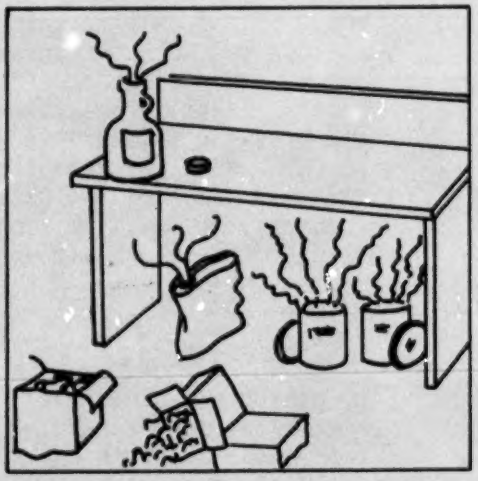
KEY POINT 2

Stay away from areas or operations where a "DANGER" sign is displayed.

STEP 3

Look for open or damaged containers when you enter any area, storage areas in particular. Whatever hazard one might expect is magnified several-fold whenever tops are not replaced on bottles or drums or when containers are leaking. Do not touch containers that are wet, corroded, rusted, or damaged. Leave the area as quickly as possible to avoid breathing vapors being given off. Without delay, notify the safety and health professional surveying the facility with you about the nature of such problems.

KEY POINT 3



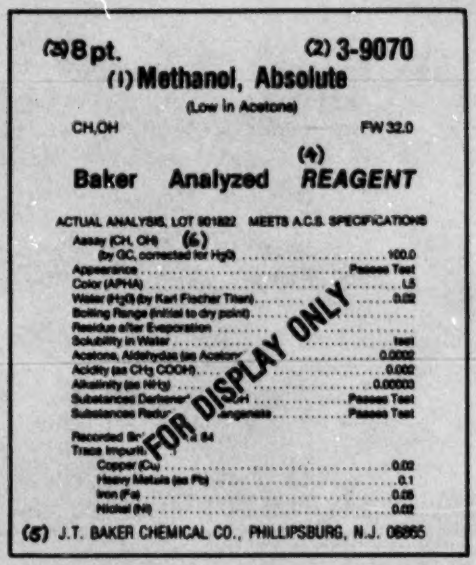
Do not linger in an area where open or damaged containers of toxic materials are kept or stored.

STEP 4

When you are able to safely check the labels of containers in storage, check the label against information in the existing inventory. Make sure you have current information on each biological, chemical, or physical agent that includes at least the following:

- o Name of agent (1)
- o Hazard class* (often indicated by the same symbols shown in Key Point 1)
- o Product number (2)
- o Quantity (3)
- o Purity (Research/ Analytical, Technical/ Reagent, Commercial/ Industrial grades) (4)
- o Manufacturer and address (5)
- o Lot number (6), and shelf-life
- o Plant identification code
- o Quantity used per workshift.

KEY POINT 4



Check the items listed on the label with those on the inventory to check currentness of information on hand.

*Refer to the National Fire Protection Association hazard codes, and the U.S. Department of Transportation hazard codes for additional symbols.

STEP	KEY POINT
STEP 5 Note where and how highly hazardous materials are stored. The containers of such materials are usually well marked. For example, amounts of flammable solvents less than 5 gallons should be stored in a well-marked flammable storage cabinet. Highly toxic substances and radioactive materials should be stored in restricted areas that can be entered only by authorized persons. Check with your escort what and where these designated storage areas are and make note of them.	KEY POINT 5 Obtain information about how and where hazardous materials are stored.
STEP 6 As you look at each area, note the general level of housekeeping. Include in your observations: o presence of accumulation of dust, chemical and organic residues, and waste scraps on floors and on and around equipment o spills not cleaned up (leave the area and return to check) o workbenches piled with tools, rags, and equipment. Poor housekeeping can lead to accidental exposures to hazardous materials.	KEY POINT 6 Check the general level of housekeeping in each area.

EXERCISES

Instruction 1: Visit an industrial shop at the institution you are attending or visit an industrial facility close to your classroom. Find hazard signs like those shown in Key Point 1; tell where they are located, and what kind of hazards they warn against.

Instruction 2: In the same facility you visited to perform Instruction 1, do the following:

- list the degree of hazard signs explained in Step 2 that you see, and tell what hazard they warn against;
- make a report of any materials marked "FLAMMABLE" that were not stored in specially marked steel cabinets;
- make a report on the overall housekeeping conditions in the facility and note any area where you found especially poor conditions.

Instruction 3: Visit a chemistry laboratory and obtain the following information from the labels and the laboratory instructor on three different chemicals taken at random from the reagent shelf:

- name of the chemical
- hazard class
- product number
- quantity in the container when it was unopened
- purity
- manufacturer and address
- lot number and shelf life, if listed
- laboratory identification code
- quantity used in any given week in the semester.

OTHER READING

National Fire Protection Association, Fire Protection Handbook, 13th ed., Boston, MA, 1969.

U.S. Department of Transportation, Title 49 Code of Federal Regulations, Part 172, Hazardous Materials Table and Hazardous Materials Communications Regulations.

LESSON THREE

OBJECTIVE

You will be able to collect information about the personal hygiene and sanitation practices workers follow to prevent accidental exposures to toxic or otherwise hazardous materials.

WHERE AND HOW TO PRACTICE

The location and conditions for practicing the steps and exercises are the same as those described for Lesson One.

HOW WELL YOU MUST DO

You must be able to develop job aids that will enable you to collect the information you are seeking without referring to any other sources of information, including this module. You must be able to collect 90 percent of the information required in each of the steps and exercises in order to fulfill the objective of this lesson.

THINGS YOU NEED

You will not need any additional equipment or supplies.

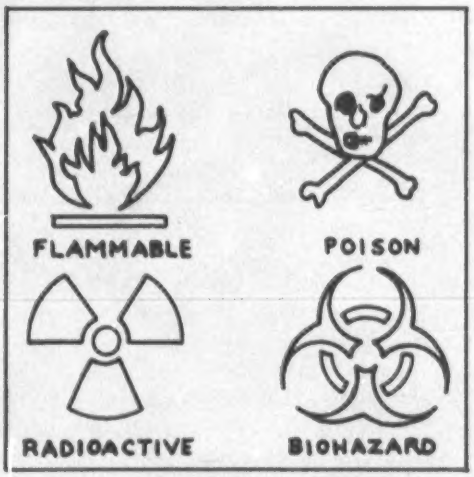
Instructions: Now turn to the next page and begin work on Lesson Three, "Getting There--Steps."

GETTING THERE--STEPS

STEP 1

While you and your escort are in each storage or work area, watch for instances in which workers are smoking, eating, or drinking. Anyone working with or around toxic biological, chemical, or physical agents should not place items in the mouth that could accidentally come in contact with workplace contaminants. Note how many workers you saw smoking, eating, or drinking during a specific amount of time you were in Area XYZ.

KEY POINT 1

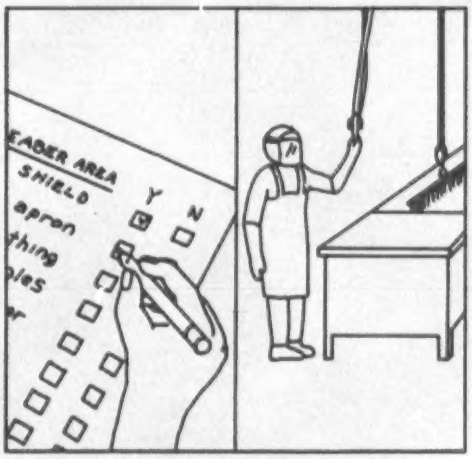


If toxic substances are present, smoking, eating, and drinking must be prohibited.

STEP 2

As you watch individuals performing their jobs, see if they are wearing the types of personal protective equipment required for the area you are in. Check the safety equipment worn by each worker against listed items required for that category of work. If you are unable to tell what a worker is doing in order to make the check, ask your escort for help.

KEY POINT 2

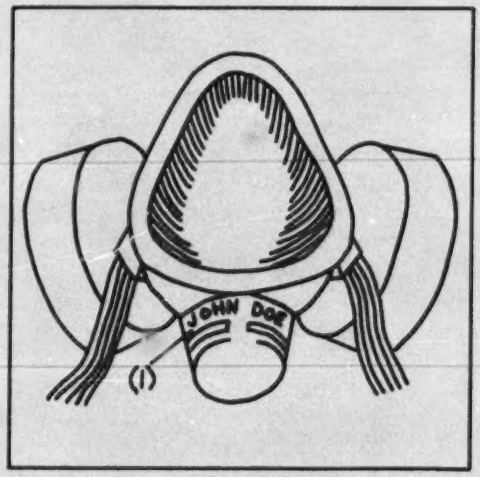


If the worker is wearing a required item of personal protective equipment, place a checkmark next to the item on your list.

STEP 3

At the end of the workshift, ask workers if they have their own (1) air-purifying respirator. In some facilities respirators are cleaned after each shift and do not need to be assigned to only one individual. If this is not the case, ask how often they are cleaned, how often they change the cartridges, and where and how the respirators are stored. Ask where you should put the respirator you have been wearing, and if you can watch the cleaning process.

KEY POINT 3

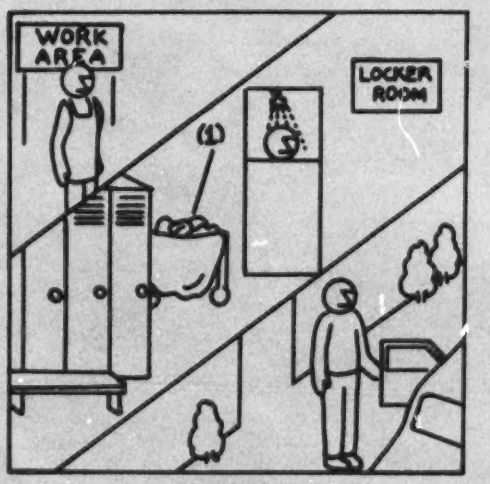


Check a worker's respirator to see if it is specially assigned.

STEP 4

At the end of the shift, watch to see whether workers who handle toxic substances change out of work clothing into street clothing before leaving the facility. Also note where they place the soiled clothing--contaminated clothing should be put into specially marked hampers or laundry carts (1). Ask about the locker room procedures workers follow for changing out of the work clothes they wear into and out of restricted areas where highly toxic substances are handled and used. Record whether the number of workers you saw were among the few or the many who left the facility after changing into street clothes.

KEY POINT 4



Contaminated work clothing must be removed before leaving the facility.

STEP 5

Freshly laundered work-clothes must not be stored where they can become easily contaminated. Check the clean clothes storage area for signs of contamination, such as the presence of dust and waste materials from the work areas. Note the location and condition of the laundry storage area.

KEY POINT 5

Clean work clothes should be stored away from work areas, and away from sources of contamination.

STEP 6

Note the overall cleanliness of the locker rooms. Accumulations of work area dirt and debris will indicate that the street clothes the worker wears home will likely be contaminated.

KEY POINT 6

Locker rooms should be free of contamination from work areas.

EXERCISES

Instruction 1: In the spaces provided, explain how smoking, eating, and drinking can cause occupational illnesses.

Instruction 2: Using any available resources such as safety equipment catalogs and safety and health publications, identify as many categories of personal protective equipment as possible. In each category, list at least three variations of the equipment and their uses. For example, in the category "gloves," you might list the following:

- disposable, latex: Uses: For handling toxic materials requiring a good sense of touch without causing the glove to deteriorate in the presence of such materials
- vinyl impregnated: Uses: For abrasion protection
- oil, grease, and acid resistant: Uses: For handling these types of materials without causing the glove to deteriorate.

Instruction 3: Visit an industrial shop or facility and practice identifying the types of personal protective equipment workers are wearing. Identify the type of worker and make a list of the equipment that the worker is wearing or using. Compare your list with a list of required equipment for that worker. Check with your instructor for possible reasons you may have missed some items. One reason may be that the worker was just not wearing the prescribed equipment.

Instruction 4: Review the procedures for cleaning and storing air-purifying respirators.

Instruction 5: To help you assess your progress in learning the skills necessary for fulfilling the objectives in this lesson, your instructor will set up "problem sets" in an industrial shop at your institution. These problem sets will be based on the steps in this lesson and will require you to identify potentially hazardous conditions or situations. (Hazards will be simulated for these practice sessions.) You should identify 90 percent of the items in each set in order to fulfill the lesson objective.

PERFORMANCE TEST

Instructions: Check your skill level or progress by working through each of the following items. If you can perform the item as well as required, place a check in the space provided. When all of the items are checked, you are ready to demonstrate your skills to your instructor. You will be considered trained in these skills after your instructor approves your performance of each item.

COLLECTING INFORMATION ABOUT INDUSTRIAL PLANT WORKFLOW AND WORKERS

No. 1 ____ Label a facility floor plan using letters or short, two- or three-word phrases to designate storage and work areas; indicate direction and flow of work using different color lines and arrows.

No. 2 ____ Make a facility inventory listing of biological, chemical, and physical agents and organize it by the work area in which the agents are used.

No. 3 ____ Collect and organize the following data by work area starting at the first point in the workflow:

____ number of assigned workers

____ job/position descriptions (PD's)

____ list of personal protective equipment (PPE) each category of worker must wear or use

____ extent of training each worker has received in the use of PPE

____ availability of medical records and illness/injury statistics.

FOR FURTHER STUDY

If you could not perform one or more of the three items above, review and practice the following lesson steps:

No. 1
Lesson One, Steps 1 and 2

No. 2
Lesson One, Step 3

No. 3
Lesson One, Step 4

PERFORMANCE TEST

COLLECTING INFORMATION ABOUT THE USE AND STORAGE OF BIOLOGICAL, CHEMICAL, AND PHYSICAL AGENTS

No. 1 ____ Explain the nature and degree of hazard represented by the warning signs you identify in an actual workplace.

No. 2 ____ Perform an inventory check of hazardous materials while taking precautions to prevent exposure to open, damaged, or broken containers of toxic materials.

No. 3 ____ Document the presence of improperly stored materials that are marked highly toxic, radioactive, or highly flammable.

No. 4 ____ Point out hazards in an industrial facility that are caused by poor housekeeping practices.

FOR FURTHER STUDY

If you could not perform one or more of the four items above, review and practice the following lesson steps:

No. 1
Lesson Two, Steps 1 and 2

No. 2
Lesson Two, Steps 3 and 4

No. 3
Lesson Two, Step 5

No. 4
Lesson Two, Step 6

PERFORMANCE TEST

COLLECTING INFORMATION ABOUT WORK PRACTICES FOR PREVENTING ACCIDENTAL EXPOSURES TO HAZARDOUS MATERIALS

No. 1 _____ Observe and record how many workers are seen smoking, eating, or drinking where hazardous materials are handled, used, or stored.

No. 2 _____ Using a checklist, determine if a worker wearing personal protective equipment is wearing what is required.

No. 3 _____ Observe and record how many workers required to wear air-purifying respirators in any given work area wear, clean, and maintain their own respirators.

No. 4 _____ Observe and record whether any workers wearing work clothing contaminated with highly hazardous materials wear such clothing out of the industrial facility.

No. 5 _____ Point out signs of inadequate housekeeping in locker-rooms/change facilities that can cause contamination of freshly laundered work clothes and street clothes.

FOR FURTHER STUDY

If you could not perform one or more of the five items above, review and practice the following lesson steps:

No. 1
Lesson Three, Step 1

No. 2
Lesson One, Step 4; Lesson Three, Step 2

No. 3
Lesson Three, Step 3

No. 4
Lesson Three, Step 4

No. 5
Lesson Three, Steps 5 and 6

REFERENCES

Patty's Industrial Hygiene and Toxicology Volume 1, George D. Clayton (ed.), New York, John Wiley and Sons, 1978.

The Industrial Environment--Its Evaluation and Control, U.S. Department of HEW, Center for Disease Control, NIOSH, 1973.